



In the United States Patent and Trademark Office

Serial Number: 10/661,842 (Provisional Serial Number: 60/410,653)
Appn. Filed: 2003 September 12
Applicant(s): Edward W. Sheehan and Ross C Willoughby
Appn. Title: Laminated Lens for Introducing Gas-Phase Ions into the Vacuum System of Mass Spectrometers
Examiner/GAU: _____ / 2881

Mailed: JAN 6, 2004

At: Pittsburgh, PA

Information Disclosure Statement

Commissioner for Patents
Alexandria, VA 22313-1450

Sir:

Attached is a completed Form PTO/SB/08(A&B) and copies of the pertinent parts of the references cited thereon. Following are comments on the non-English-language reference (**Forssmann**) pursuant to Rule 98 and an additional reference (**Potjewyd**) not cited in our original application:

Forssmann shows an atmospheric focusing device with an accelerating and a focusing device, with the focusing device made up of a series of lens with decreasing apertures at higher potentials than the latter part of the accelerating device, for controlling the direction of the ions. **Potjewyd** shows a alternative focusing funnel (see Figures 3-1 thru 3-3, 4-1, and 4-8), with a thick dielectric layer sandwiched between two lens with different sized central apertures forming a funnel lens, for focusing ions into an aperture leading into the vacuum system of a mass spectrometer.

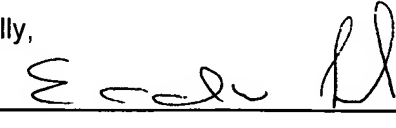
Neither of these references shows a **thin laminated high transmission surface populated with a purality of openings** upstream of a **stratified lens** made up of thin alternating layers of insulating material and metal lens forming a low-electrostatic field focusing region between the laminated surface and the stratified lens for focusing substantially all the ions from the ion source through the laminated surface and the stratified lens and into an inlet aperture with progressively lower electrostatic potentials as it is recited in independent claims 6 and 12, and hence their respective dependent claims 7 to 11 and 13 to 14.

To the contrary, both references show ion focusing funnels with **one opening and not favorable electrostatic potentials across the funnel**. Forssmann utilizes an **increasing electrostatic potential** causing the deceleration and deflection of the ions into the walls of the funnel. While Potjewyd utilizes a **decreasing electrostatic potential difference between just two metal electrodes separated by a thick dielectric layer** causing some of the ions to collide with the dielectric layer. Both situations causing the loss of ions as they pass through the funnel.

Also, none of these references show a stratified funnel shaped lens made up of numerous thin alternating layers of metal and insulating layers with a potential difference established from the ions source, across the lens to the inlet aperture, as it is recited in independent claim 1 and 15, and their respective dependent claims 2 to 5 and 16 to 19.

Very Respectfully,

Applicant(s):



Enc.: PTO/SB/08(A&B) & References

c/o: Edward W. Sheehan and Ross C. Willoughby, Applicants Pro Se

Chem-Space Associates, Inc., 655 William Pitt Way, Pittsburgh, PA 15238

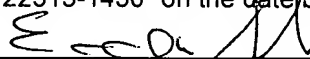
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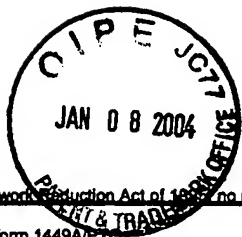
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, Applicant



PTO/SB/08a (08-03)

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STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 1 of 3

Complete if Known

Application Number	10/661,842
Filing Date	2003 September 12
First Named Inventor	Sheehan, E.W.
Art Unit	2881
Examiner Name	
Attorney Docket Number	

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
		US- 4,300,004	11/10/1981	Iribane et al.	
		US- 4,318,028	3/2/1982	Perel et al.	
		US- 4,531,056	7/23/1985	Labowsky et al.	
		US- 4,542,293	9/17/1985	Fenn et al.	
		US- 5,306,910	4/26/1994	Jarrell et al.	
		US- 5,412,208	5/2/1995	Covey et al.	
		US- 5,559,326	9/24/1996	Goodley et al.	
		US- 5,747,799	5/5/1998	Franzen	
		US- 5,750,988	5/12/1998	Apffel et al.	
		US- 5,838,002	11/17/1998	Sheehan	
		US- 6,278,111 B1	8/21/2001	Sheehan et al.	
		US- 6,455,846 B1	9/24/2002	Prior et al.	
		US- 2003/0,038,236	2/27/2003	Russ et al.	
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FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ³
		Country Code ³ Number ⁴ Kind Code ⁵ (if known)				
		WO 98/07,505	2/26/1998	Sheehan		
		WO 03/010,794 A2	2/6/2003	Forssmann et al.		

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SignatureDate
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10/661,842

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First Named Inventor

Sheehan, E.W.

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Attorney Docket Number

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		POTJEWD, J., "Focusing of ions in atmospheric pressure gases using electrostatic fields," Ph.D. Thesis, University of Toronto (1983).	
		MAHONEY, J.F., ET AL., "A theoretical and experimental basis for producing very high mass biomolecular ions by electrohydrodynamic emission," 22th IEEE Industry Applications Society Annual Meeting, Atlanta, GA, October 18-23, 1987.	
		OLIVARES, J.A., ET AL., "On-line mass spectrometric detection for capillary zone electrophoresis," Anal. Chem. 59, pages 1230-1232 (1987).	
		LEE, T.D., ET AL., "An EHD source for the mass spectral analysis of peptides," Proceedings of the 36th ASMS Conference on Mass Spectrometry and Allied Topics, San Francisco, CA, June 5-10, 1988.	
		SMITH, R.D., ET AL., "Capillary zone electrophoresis-mass spectrometry using an electrospray ionization interface," Anal. Chem. 60, pages 436-441 (1988).	
		LEE, T.D., ET AL., "Electrohydrodynamic emission mass spectra of peptides," Proceedings of the 37th ASMS Conference on mass Spectrometry and Allied Topics, Miami Beach, FL, May 21-26, 1989.	
		MAHONEY, J.F., ET AL., "Electrohydrodynamic ion source design for mass spectrometry: ionization, ion optics and desolvation," Proceedings of the 38th ASMS Conference on Mass Spectrometry and Allied Topics, Tucson, AR, June 3-8, 1990.	
		BRUINS, A.P., "Mass Spectrometry with ion sources operating at atmospheric pressure," Mass Spectrom. Rev. 10, pages 53-77 (1991).	
		FENG, X., ET AL., "Single isolated droplets with net charge as a source of ions," J. Am. Soc. Mass Spectrom. 11, pages 393-399 (2000).	
		SCHNEIDER, B.B., ET AL., "An atmospheric pressure ion lens to improve electrospray ionization at low solution flow-rates", Rapid Commun. Mass Spectrom 15, pages 2168-2175 (2001).	

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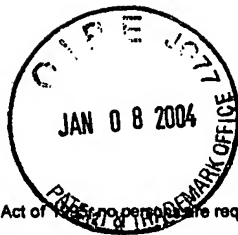
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Sheehan, E.W.

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NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		ALOUSI, A., ET AL., "Improved transport of atmospheric pressure ions into a mass spectrometer," The Proceedings of the 50th ASMS Conference on Mass Spectrometry and Allied Topics, Orlando, Florida, June 2-6, 2002.	
		KLESPER, H., ET AL., "Intensity increase in ESI MS by means of focusing the spray cloud onto the MS Orifice," The Proceedings of the 50th ASMS Conference on Mass Spectrometry and Allied Topics, Orlando, Florida, June 2-6, 2002.	
		SCHNEIDER, B.B., ET AL., "An atmospheric pressure ion lens that improves nebulizer assisted electrospray ion sources", J. Am. Soc. Mass Spectrom. 13, pages 906-913 (2002).	

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